Bellcomm

955 L'Enfant Plaza North, S.W.
Washington, D. C. 20024

date: July 27, 1971

to: Distribution

B71 07043

from: W. J. Benden

subject: Investigation of Recent High Voltage Failure on Skylab S-193 Experiment Case 620

MEMORANDUM FOR FILE

At the request of MSC the author participated as a member on a corona investigating team at the General Electric plant in Utica, New York on June 29 and 30, 1971. The team investigated the altimeter portion of the S-193 experiment (S-193 consists of a microwave radiometer/ scatterometer and altimeter). A list of the team members/ attendees is attached. At the request of Mr. G. A. Vacca/ MLE the author presented the results of this investigation to Mr. W. C. Schneider/ML on July 7, 1971 at NASA Headquarters.

Briefly, the altimeter portion of the S-193 experiment had been vacuum soaked at 10^{-6} Torr. for 48 hours in a non-operating condition. Approximately 30 seconds after being switched to the operate mode, high voltage (-11Kv) arcing caused two diodes and one capacitor to fail in the modulator subassembly.

The arcing was caused by the formation of a crevice between potting material and a spacer in the modulator. The newly exposed surface area of the potting material supplied enough gas molecules to allow for ionization breakdown across this interface. The excessive current being drawn by the arcing caused the previously mentioned components to fail.

The surfaces in the modulator will be cleaned and primed (not primed previously) prior to repotting in order to obtain better adherence thus reducing the possibility of air gap formation. The removal of shrink tubing and replacement of stranded wire by solid wire are examples of other steps being taken to prevent air entrapment and to provide for better adherence. Of course the damaged components will be re

Thermal vacuum tests will be performed and, assuming successful operation, two new modulators will be constructed in the same manner for actual Skylab use.

William J Benden

2034-WJB-vh

W. J. Benden

Attachment
Attendee List

ATTENDEE LIST

W. J. Benden/Bellcomm
E. Bunker/JPL
A. Pajak/MSC
H. Snyder/Boeing/NASA/MSC

} Investigation Team

R. Bianchi GE/SSO

L. McLaren GE/AESD

A. Swartz GE/AESD

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Distribution List

NASA Headquarters

H. Cohen/MLQ
J. H. Disher/MLD
T. E. Hanes/MLA
A. S. Lyman/MR
M. Savage/MLE
W. C. Schneider/ML
G. A. Vacca/MLE

MSC

A. W. Pajak/EE-3

MSFC

R. E. Pace/PM-SL-EI

Bellcomm, Inc.

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